

Application No. 10/584,694
Amendment Dated: December 20, 2010
Reply to Office Action Dated September 27, 2010

Remarks

Claims 1-27 are pending.

Claims 1-27 stand rejected.

Claims 1, 6, 21, 26 and 27 have been amended.

Claims 2, 4, 7 and 8 have been cancelled.

Claims 1, 3, 5-6 and 9-27 are submitted herein for review.

No new matter has been added.

Applicants begin by requesting a telephonic interview. This Amendment is being filed after-final with an RCE. Applicants request an interview during the consideration of this Amendment and will telephone the Examiner in the first week of January 2011. If the Examiner considers the merits of this action prior to that time, please contact the undersigned agents for Applicants.

In the first section of the Office Action, the Examiner has objected to the spelling of "calliper" in the claims. Applicants have amended the independent claims accordingly and respectfully request that this rejection be withdrawn.

Turning to the prior art, the Examiner has rejected independent claims 1, 6, 21 and 26 under 35 U.S.C. § 103(a) as being unpatentable over Mori (U.S. Patent No. 6,367,595).

Applicants respectfully disagree with the Examiner and submit the following remarks in reply.

Applicants begin by noting that the subject matter of independent claims 1, 21 and 26 have been amended to include the subject matter of now cancelled claims 2 and 4. It is noted

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that before incorporation of claim 4 into claims 1, 21 and 26 a correction was made to the following phrase "...expressed as the ratio of thickness to circumferential extension of said ~~one or more shells~~ entire connecting structure relative to the axis of rotation of the brake disc is between 2/100 and 4/100" to bring this into conformity with the description in the specification, as seen for example in paragraph [0025].

Separately, independent claim 6 has been separately amended to include the subject matter of now cancelled dependent claims 7 and 8.

To this end, among other elements, independent claims 1, 21 and 26 include the feature of the one or more shells delimiting one or more through openings, in which the total area of opening of the through openings is less than 40% of the total area of the one or more shells including that of the through openings in which the slenderness of the entire connecting structure formed by the one or more shells, including the through openings, expressed as the ratio of thickness to circumferential extension of the entire connecting structure relative to the axis of rotation of the brake disc is between 2/100 and 4/100.

Regarding claim 6, among other feature, this claim includes the feature of the shell-type connecting structure extending substantially along an arc of circle having a radius of 180 mm to 220 mm, in which the average thickness of the shell is between 5 mm and 15 mm and wherein the circumferential extension of the shell-type connecting structure corresponds to an angle of aperture of a sector of circle of between 100° and 130°.

In forming the rejection of these elements (claim 4 and 8) the Examiner argues that Mori does not teach these elements, but that "[i]t would have been obvious to one of ordinary skill in

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the art to provide the caliper of Mori et al. *with the above range limitations as a matter of engineering design choice* by increasing the length of the circumferential extension of the left and right bridge portions of Mori's caliper housing, since the above range of limitations are based on some of the factors that depend on the size of the caliper, the number of through openings on the bridge or connecting structure of the caliper housing, the thickness of the bridge," ... etc.. (See Office Action at pg. 3-4).

In other words the Examiner is arguing that the claimed ranges from claims 4 and 8 are merely design choice and the ranges are simply incidental to the construction of the brake. However, such an analysis is incorrect.

Applicants are aware that "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). However, a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See MPEP 2144.05. In other words "[A] patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the 'subject matter as a whole' which should always be considered in determining the obviousness of an invention under 35 U.S.C. § 103." *In re Spomnoble*, 405 F.2d 578, 585, 160 USPQ 237, 243 (CCPA 1969). See MPEP 2141.02.

This is the case in the present arrangement. For example as stated in paragraph [0004]:

"The braking force transmitted by friction from the brake disc to the pads

and from these through the caliper body to the vehicle suspension involves further torsional and shear loads on the caliper body. The result of this, in addition to a large shear force, is a further bending moment in the connecting bridges. This state of three-dimensional loads on the caliper body during braking results in substantial deformation and distortion of the body. This means that it is necessary to oversize both the caliper body itself and the suspension at the points at which the caliper is attached in order to prevent relative axial motion of the two attachment points so as to limit the distortion of the caliper body.”

The presently claimed arrangement, as discussed for example in paragraphs [0025] and [0028] are, among other features, configured to address this issue. As stated in paragraph [0042]:

“The connecting structure 5 is therefore a shell structure or in other words a structure with a sufficiently thin wall and a sufficiently large surface extension to transmit between the side walls 2 both the force of reaction to the axial thrust of the thrust means (hydraulic pistons 8) and the actual braking force as a shell or shear wall structural system instead of transmitting these forces as a frame system with rigid nodes and beams as is the practice in solutions using known technology.”

In other words, the dimensions as claimed in claims 1, 6, 21 and 26 are not mere design choice, but are included along with the other features of the claims to alleviate a specific problem encountered in prior art designs.

For at least this reason, Applicants request that the rejection of independent claims 1, 6, 21 and 26 be withdrawn. As claims 3, 5, 9-20 and 22-25 depend from claims 1, 6 and 21 these claims should be allowed for at least the same reason.

Applicants separately note that claim 27 was introduced in the prior Amendment. It includes among other features that the one or more shells circumferentially overlap the area of the seating for the pads. The Examiner has given no rejection for this claim. It is listed as

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rejected on the cover page, but no comments are expressly directed to this claim. Applicants request consideration on the merits. To the extent that the Examiner considers the claim in the same vein as claims 1, 6, 21 and 26, Applicants submit that claim 27 should be held allowable for at least the same reasons set forth above in support of claims 1, 6, 21 and 26.

In view of the foregoing, Applicants respectfully submit that pending claims 1, 3, 5-6 and 9-27 are in condition for allowance, the earliest possible notice of which is earnestly solicited. If the Examiner feels that an interview would facilitate the prosecution of this Application he is invited to contact the undersigned at the number listed below.

Dated: December 20, 2010

Respectfully submitted,

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